Perspective

Sanitation Systems (/perspective/sanitation-systems-perspective)

Section

Sanitation Technologies (/sanitation-systems/sanitation-technologies)

Factsheet

Urine-Diverting Dry Toilet (UDDT)

العربية (/ar/sanitation-systems/sanitation-technologies/urine-diverting-dry-toilet-(uddt))

Applicable to	Application level	Management level	Inputs	Outputs
System 4 (/sanitation-systems/sanitation-systems/system-4%3A-waterless-system-with-urine-diversion)	*Not applicable*	*Not applicable*	Dry Cleansing Materials Anal Cleansing Water Urine Faeces	Anal Cleansing Water Urine Faeces + Dry Cleansing Materials

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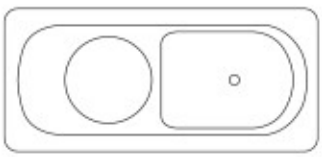
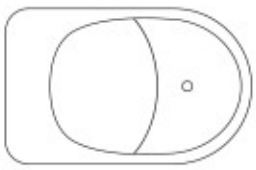
Adapted from

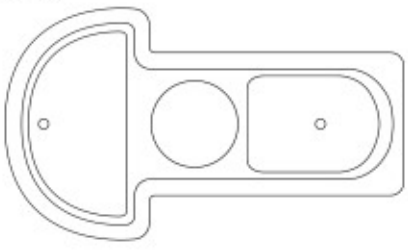
Compendium of Sanitation Systems and Technologies. 2nd Revised Edition (/node/5587)

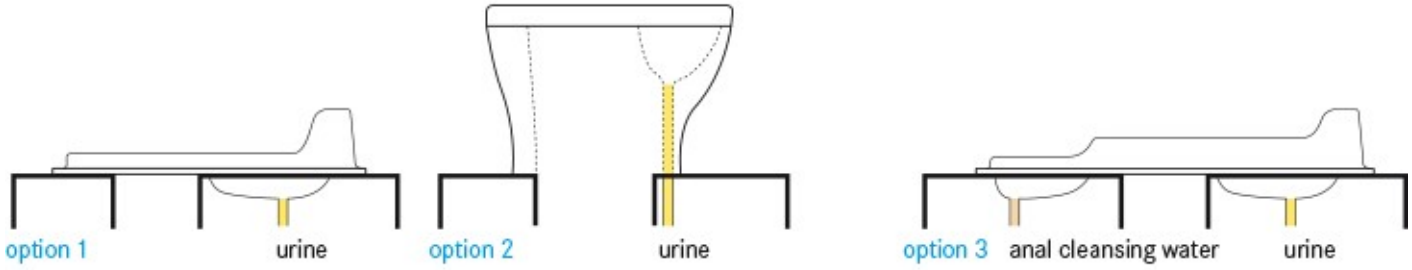
for wipers





for washers





Executive Summary

A urine-diverting dry toilet (UDDT) is a toilet that operates without water and has a divider so that the user, with little effort, can divert the urine away from the faeces.

Advantages

- Does not require a constant source of water
- No real problems with odours and vectors (flies) if used and maintained correctly (i.e., kept dry)
- Can be built and repaired with locally available materials
- Low capital and operation costs
- Suitable for all types of users (sitters, squatters, washers, wipers)

Disadvantages

- Prefabricated models not available everywhere
- Requires training and acceptance to be used correctly
- Is prone to misuse and clogging with faeces
- The excreta pile is visible

In	Out
Urine, Faeces, Anael Cleansing Water, Dry Cleansing Material	Urine, Faeces, Anael Cleansing Water, Dry Cleansing Material, Fertiliser, Compost/Biosolids

Introduction

The UDDT is built such that urine is collected and drained from the front area of the toilet, while faeces fall through a large chute (hole) in the back. Depending on the Collection and Storage/Treatment technology that follows, drying material such as lime, ash or earth should be added into the same hole after defecating.

Design considerations

It is important that the two sections of the toilet are well separated to ensure that a) faeces do not fall into and clog the urine collection area in the front, and that b) urine does not splash down into the dry area of the toilet. There are also 3-hole separating toilets that allow anal cleansing water to go into a third, dedicated

basin separate from the urine drain and faeces collection. Both a pedestal and a squat slab can be used to separate urine from faeces depending on user preference.

Urine tends to rust most metals; therefore, metals should be avoided in the construction and piping of the UDDT. To limit scaling, all connections (pipes) to storage tanks should be kept as short as possible; whenever they exist, pipes should be installed with at least a 1% slope, and sharp angles (90°) should be avoided. A pipe diameter of 50 mm is sufficient for steep slopes and where maintenance is easy. Larger diameter pipes (> 75 mm) should be used elsewhere, especially for minimum slopes, and where access is difficult. To prevent odours from coming back up the pipe, an odour seal should be installed at the urine drain.

Health aspects/acceptance

The UDDT is not intuitive or immediately obvious to some users. At first, users may be hesitant about using it, and mistakes made (e.g., faeces in the urine bowl) may deter others from accepting this type of toilet as well. Demonstration projects and training are essential to achieve good acceptance with users. For better acceptance of the system and to avoid urine in the faeces collection bowl, the toilet can be combined with a urinal, allowing men to stand and urinate.

Operation & maintenance

A UDDT is slightly more difficult to keep clean compared to other toilets because of both the lack of water and the need to separate the solid faeces and liquid urine. No design will work for everyone and, therefore, some users may have difficulty separating both streams perfectly, which may result in extra cleaning and maintenance. Faeces can be accidentally deposited in the urine section, causing blockages and cleaning problems.

All of the surfaces should be cleaned regularly to prevent odours and to minimize the formation of stains. Water should not be poured in the toilet for cleaning. Instead, a damp cloth may be used to wipe down the seat and the inner bowls. Some toilets are easily removable and can be cleaned more thoroughly. It is important that the faeces remain separate and dry. When the toilet is cleaned with water, care should be taken to ensure that the faeces are not mixed with water.

Because urine is collected separately, calcium- and magnesium-based minerals and salts can precipitate and build up in pipes and on surfaces where urine is constantly present. Washing the bowl with a mild acid (e.g., vinegar) and/or hot water can prevent the build-up of mineral deposits and scaling. Stronger (> 24% acetic) acid or a caustic soda solution (2 parts water to 1 part soda) can be used for removing blockages. However, in some cases manual removal may be required. An odour seal also requires occasional maintenance. It is critical to regularly check its functioning.

Applicability

The UDDT is simple to design and build, using such materials as concrete and wire mesh or plastic. The

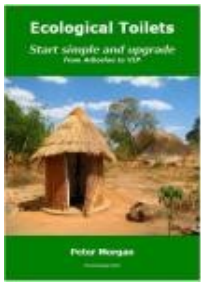
UDDT design can be altered to suit the needs of specific populations (i.e., smaller for children, people who prefer to squat, etc.).

Media PPT

Urine Diversion Dehydration Toilets (PPT) (/media/19)

Library References

Ecological Toilets



This book describes how to construct Arborloo toilets and how it can be upgraded to VIPs at a later stage.

MORGAN, P. EcoSanRes (2009): Ecological Toilets. (pdf presentation). Stockholm: Stockholm Environment Institute **URL (http://www.ecosanres.org/pdf_files /EcologicalToilets-PeterMorgan-Mar2009.pdf)** [Accessed: 09.05.2019]

Toilets That Make Compost

Toilets That Make Compost
Low-cost, sanitary toilets that produce valuable compost for crops in an African context
by
Peter Morgan

This book describes in an easy-to-understand and picture-based way how to construct three different low cost sanitation solutions, namely arborloos, fossa alterna and urine diversion toilets.

MORGAN, P. EcoSanRes (2007): Toilets That Make Compost . Stockholm: Stockholm Environment Institute **URL (http://www.ecosanres.org/pdf_files /ToiletsThatMakeCompost.pdf)** [Accessed: 09.05.2019]

Technology Review of Urine Diversion Components

The publication explains the purposes of urine diversion, its benefits and challenges, urine precipitation, urine treatment and reuse in agriculture. Further, it provides an overview on design and operational aspects for equipment needed, such as waterless urinals and urine diversion toilets including supplier information and indicative costs. Overall, it pulls together scattered knowledge around the topic of urine diversion in a concise manner.

MUENCH, E. von WINKER, M. (2011): Technology Review of Urine Diversion Components. Overview of Urine Diversion Components such as Waterless Urinals, Urine Diversion Toilets, Urine Storage and Reuse Systems. Eschborn: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH **URL**

Smart Sanitation Solutions (https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/875) [Accessed: 11.05.2019]

Smart Sanitation Solutions presents examples of low-cost household and community-based sanitation solutions that have proven effective and affordable. A wide range of innovative technologies for toilets, collection, transportation, treatment and use of sanitation products that have already helped thousands of poor families to improve their lives is illustrated.

NWP (2006): Smart Sanitation Solutions. Examples of innovative, low-cost technologies for toilets, collection, transportation, treatment and use of sanitation products. (= Smart water solutions). Amsterdam: Netherlands Water Partnership (NWP) **URL (https://www.ircwash.org/resources/smart-sanitation-solutions-examples-innovative-low-cost-technologies-toilets-collection)** [Accessed: 09.05.2019]

Technology Review of Urine-Diverting Dry Toilets (UDDTs)

This publication offers a complete overview of UDDT functions, design considerations, common operation and maintenance issues and generalised installation costs. Its focus is on applications in developing countries and countries in transition, although UDDTs are also applicable in developed countries.

RIECK, C. MUENCH, E. HOFFMANN, H. (2012): Technology Review of Urine-Diverting Dry Toilets (UDDTs). Overview on Design, Management, Maintenance and Costs. (= Technology Review). Eschborn: German Agency for Technical Cooperation (GTZ) GmbH **URL (https://www.susana.org/en/knowledge-hub/resources-and-publications/library/details/874)** [Accessed: 11.05.2019]

Ecological Sanitation - revised and enlarged edition

This book is one of the most fundamental and important books that defined the concept of ecological sanitation. The first version came out in 1998 - this version presents the findings of over ten years of research and development in ecological sanitation supported by SIDA (Swedish International Development Cooperation Agency).

WINBLAD, U. SIMPSON-HERBERT, M. (2004): Ecological Sanitation - revised and enlarged edition. (pdf presentation). Sweden: Stockholm Environment Institute **URL (http://www.ecosanres.org/pdf_files/Ecological_Sanitation_2004.pdf)** [Accessed: 04.08.2010]

Further Readings

SuSanA Forum: Using Oyster Mushrooms to stop Human Faeces smelling in UDDTs

http://forum.susana.org/forum/categories/34-urine-diversion-systems-includes-uddt-and-ud-flush-toilet/22187-poopac-using-oyster-mushrooms-to-stop-human-faeces-smelling-in-uddts-a-masters-thesis/23993 (http://forum.susana.org/forum/categories/34-urine-diversion-systems-includes-uddt-and-ud-flush-toilet/22187-poopac-using-oyster-mushrooms-to-stop-human-faeces-smelling-in-uddts-a-masters-thesis/23993) [Accessed: 05.03.2018]